

WHAT IS CLAIMED IS:

1. An automatic guidance system for guiding a flight vehicle having a parafoil to a target grounding point, comprising the steps of:

5 opening the parafoil of said flight vehicle dropped in a predetermined area above a target grounding point;

estimating wind velocity and wind direction after the parafoil of said flight vehicle is opened;

10 determining a landing flight path of said flight vehicle based on said estimated wind velocity and wind direction;

guiding the flight of said flight vehicle to a position close to said determined landing flight path; and

15 descending said flight vehicle according to said landing flight path.

2. An automatic guidance system according to claim 1, wherein, when the parafoil of said flight vehicle is dropped in a predetermined area on the windward of and above the target grounding point, said determining step determines the landing
20 flight path so that said flight vehicle descends from the windward to the leeward, and said descending step descends from the windward to the leeward according to the said landing flight path.

3. An automatic guidance system according to claim
25 2, further comprising the step of:
changing an attitude of said flight vehicle so as to direct

said flight vehicle to the leeward in the position close to said landing flight path.

5A. An automatic guidance system according to claim
5 2, further comprising the step of:

landing said flight vehicle by changing the attitude of said flight vehicle so as to direct said flight vehicle windward on the leeward of said target grounding point.

6A. An automatic guidance system according to claim
10 4, further comprising the step of:

adjusting the altitude of said flight vehicle before said descending step.

9A. An automatic guidance system according to claim
15 1, wherein, in said estimating step, said estimation of said wind velocity and wind direction is calculated by the ground speed of said flight vehicle obtained by GPS or DGPS.

10A. An automatic guidance system according to claim
20 1, wherein, in said estimating step, said estimation of said wind velocity and wind direction is calculated by the ground speed of said flight vehicle obtained by GPS or DGPS, the azimuth of said flight vehicle and the airspeed of said flight vehicle.

25

6 7. An automatic guidance system according to claim 5, wherein, in said adjusting step, said altitude adjustment of said flight vehicle is performed by a continuous turn of said flight vehicle.

5

6 8. An automatic guidance system according to claim 5, wherein, in said adjusting step, said altitude adjustment of said flight vehicle is performed by a race track turn of said flight vehicle.

10

4 10. An automatic guidance system according to claim 2, wherein said guiding step guides the flight of the flight vehicle in a direction perpendicular to the estimated wind direction.

15

11. A navigation guidance apparatus for guiding a flight vehicle having a parafoil to a target grounding point, comprising:

a wind-velocity and wind-direction estimating unit estimating wind velocity and wind direction after the parafoil of said flight vehicle is opened;

a land flight path determining unit determining a landing flight path of said flight vehicle based on the wind velocity and wind direction estimated by said wind-velocity and wind-direction estimating unit; and

a flight control unit controlling said parafoil so that said flight vehicle descends according to the landing flight path determined by said flight path determining unit.

5 12. A navigation guidance apparatus according to claim 11, wherein said wind-velocity and wind-direction estimating unit includes:

 a GPS receiver; and

 a flight computer estimating the wind velocity and wind
10 direction based on ground speed vectors obtained by said GPS receiver.

15 ~~15~~13. A navigation guidance apparatus according to claim 11, wherein said wind-velocity and wind-direction estimating unit includes:

 a GPS receiver;

 a magnetic direction sensor detecting the azimuth of said flight vehicle; and

20 a flight computer estimating the wind velocity and wind direction based on ground speed vectors obtained by said GPS receiver, the azimuth of said flight vehicle obtained by said magnetic direction sensor and the airspeed of said flight vehicle.

25 ~~17~~14. A navigation guidance apparatus according to claim 11, wherein said wind-velocity and wind-direction

estimating unit further includes a DGPS beacon receiver.

13 ~~15~~. A navigation guidance apparatus according to
claim 12, wherein said wind-velocity and wind-direction
5 estimating unit further includes a DGPS beacon receiver.

14 ~~16~~. A navigation guidance apparatus according to
claim 12, wherein said flight path determining unit is the flight
computer determining the flight path based on the estimated wind
10 velocity and wind direction, and

wherein said flight control unit is an actuator for
tugging control lines of said parafoil under the control of said
flight computer.

15 16 ~~17~~. A navigation guidance apparatus according to
claim ~~13~~ ¹⁵, wherein said flight path determining unit is the flight
computer determining the flight path based on the estimated wind
velocity and wind direction, and

wherein said flight control unit is an actuator for
20 tugging control lines of said parafoil under the control of said
flight computer.